Written Testimony of Gordon West
Acting Assistant Administrator, Asia and Near East Bureau
and Dr. John Wilson
Senior Environment and Agriculture Specialist, Asia and Near East Bureau

The United States and the Iraqi Marshlands:
An Environmental Response

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Summary: In the highly dynamic, post-war situation, the U.S. Agency for International Development is leading an interagency effort with the U.S. State Department's Bureau for Oceans and International Environmental and Scientific Affairs (OES) to develop an action plan for marshland restoration. The $4 million program intends to integrate economic development and ecosystem marsh management, implement restoration and social economic assistance programs, collect and monitor data for reflooded sites, and develop capacity in Iraqi government and universities in marshland management and restoration.

From June 15-28, 2003, USAID project staff met with marsh dwellers to assess social and economic conditions. The team visited a wide range of tribesmen and women throughout the marshes from the traditional floating islands populations to rice growers living on the periphery. They extensively visited the existing, reflooded, and drained marshes on the ground and in helicopter flyovers. Foreign and Iraqi experts have collected soil and water samples from the natural and reflooded marshes. All of the USAID-financed activities have involved scientists from the University of Basra and established working relationships with national and district level Ministry of Water Resources officers.

Preliminary conclusions on the status of the marshes note that some portions of Hawizeh and Hammar marsh still retain native vegetation and good water quality. Some of the formerly drained wetlands have recently been reflooded. These regions may be a seed source and faunal population base for restoring the drained marshes. By contrast, Central marsh has suffered massive drainage, and little wetland remains. Vast areas of former marsh are now barren or are sparsely covered with Tamarix and other desert species. Dust storms are now prevalent in the former marsh areas.

The next steps in the marsh assistance program include more on-the-ground investigation and discussions with Iraqi officials to understand the drainage system and develop a precise inventory of all structures. People in the marshes want clean drinking water, mosquito control, jobs, health care, and improved security. Marsh-based activities alone will probably not provide an adequate economic base. The previous regime's aggressive policies draining the marshes and promoting unsustainable wheat-growing as a monoculture undermined the region's economic base.

I. Introduction

Historical Background: The Iraqi Marshlands

In little more than a decade, Saddam Hussein's regime systematically destroyed one of the world's largest wetlands ecosystems. This environmental disaster, perpetrated in the roughly 20,000 square kilometer marshlands of southern Iraq, an area more than twice the size of the Florida Everglades, has been compared in scale to the drying up of the Aral Sea in Central Asia and the deforestation of the Amazon. The area was once famous for its cultural richness and biodiversity. The marshes were the permanent habitat for millions of birds and a flyway for billions more

migrating between Siberia and Africa. Sixty-six bird species may now be at risk. Other populations are thought to be in serious decline. Coastal fisheries in the Persian Gulf used the marshlands for spawning migrations, and they served as nursery grounds for shrimp and fish. Now fish catches have been significantly decreased. The marshlands also once served as a natural filter for waste and other pollutants in the Tigris and Euphrates rivers, protecting the gulf which has now become noticeably degraded along the coast of Kuwait.

The indigenous marsh dwellers already have a special place in the anthropological and travel literature for their alluring way of life, living in harmony with the environment on manmade reed islands and along the periphery of the marshes in relative isolation. They may have numbered a half a million in the 1950s and a quarter of a million in the early 1990s. In 1991, a populist Shi'a uprising at the end of the Gulf War brought down the full and brutal weight of the Baghdad regime. The military raided settlements, killed tens of thousands of Marsh Arabs - although the actual number may be higher, burned settlements, and killed livestock, destroying the core of the local economy.

The period from 1991 to 1997 was marked by engineering programs which drained the marshes through the construction of manmade rivers and canals of massive proportions and overblown names. They diverted water from the marshes to irrigate vast areas for uneconomical and unsustainable wheat production, fill huge depressions or ponds to evaporate, or drain into the Shatt Al Arab. A disproportionate share of the country's limited resources was channeled into these works. By 1999, the draining of the marshes was largely over. The only remaining marsh of any note was the northern portion of Hawizeh which straddles the Iran-Iraq border. The other two marshes, Hammar and Central to the west, were totally desiccated.

At the beginning of 2003, only seven percent of the original marshlands remained. However, there has been some recent reflooding throughout the marshes. This water appears to be from a combination of heavier than usual snows in the north, the deliberate destruction of structures by people in the area after the war, the opening of gates by local government officers, and the release of water by Iran to the east.

Marsh Dwellers: Identity, Settlement and Rights

As recently as the 1970s, there was a limited government presence in the marshlands. The Iran-Iraq War of the 1980s brought the Saddam Hussein regime in full military strength, and the displacement of tribes closest to the border began. Marsh dwellers were moved from Hawizeh in 1984 so that a dike for gun emplacements and a large army base could be built. The dike effectively drained large areas of the marsh and started the people on a series of forced moves over the succeeding 15 years. It was also the most sustained contact with the government to date. The marsh dwellers were said to have strongly supported the Iraq government during that war. The situation became more unstable with the Gulf War, and there are reports that both marsh dwellers and outsiders escaped into the marshes for refuge, this time earning the wrath of the Iraqi army.

Following the Gulf War in February 1991, the Shi'a population rebelled against the regime after active outside encouragement, apparently taking control of most of the South. In March, the government brought in tanks and helicopters and regained control through the brutal killing of 100,000 or more people and the wholesale destruction of cities and towns. The drainage of the marshes was then put into high gear, becoming one of the highest government priorities, despite the huge investment required. The period also marked an expanded effort to force the marsh dwellers into internal displacement or foreign exile. Roughly 100,000 southern Iraqis are in border refugee camps in Iran; an uncertain number are in Saudi Arabia. No one is certain how many marsh dwellers live within the former or still existing marshlands, but estimates suggest 100,000 to 150,000 other marsh dwellers have moved farther outside the area, usually to the cities in the South.

Given the social upheaval during the past 20 years, intensifying over the last 12, the team was particularly interested in better understanding the extent to which this treatment was uniform across the marshes, the degree of displacement and social disorder, and strategies for economic assistance in such a war-torn environment.

Diversity within the Marsh Dweller Population

Marsh Arabs are members of nine major indigenous tribes and live within and on the margins of the marshes. Initial findings of a USAID-funded demographic census and public health survey, indicate that there are roughly 85,000 people who are Marsh dwellers still living in or residing on the margins of the marshes. This number is roughly double what people generally have believed to still be in the area and a third of population 20 years ago. In addition to the Marsh Arabs there are peripheral dwellers, not members of those nine tribes, who utilize the marshes directly or indirectly.

There are five major patterns of settlement and economic use of the marshes for those who are living in marsh, on its periphery, or were forced into internal or external exile. These differences have important implications for deciding who are to be the beneficiaries of the marshlands program.

1. *Marsh Arabs living inside the marshes in traditional patterns, having a long history of living on small, isolated islands.*

   There are marsh dwellers still residing in the interior of Hammar marsh in small communities. This is an area written about the earlier travelers' accounts. The one settlement visited, named Al bu Ajaj in Al Chibayish, was first displaced in 1991 and moved as a group eight times in nine years, only to be brought back by the army to within a kilometer of where they began. They spoke of burned houses and killed livestock. They now live in both reed and unbaked mud brick houses and have boats for fishing, water buffalo for a major part of their diet, and minor agricultural productivity. These people are suffering from malnutrition and water-borne diseases and drinking untreated and unfiltered water directly out of the marsh. They have neither schools nor primary health care.

2. *Marsh Arabs who had lived in the marshes but were displaced to drained areas on the margin of the present marshes.*

   Displaced dwellers were moved between six and sixteen times during a nine year period. Among the early displaced people were the dwellers in Turaba in Hawizeh marsh on the Iran border, who were relocated in 1984 when the army built a dike and large base on their village site. Many more were displaced in 1991 after the Shi'a uprising.

3. *People living stably on the edge of newly reflooded marshes with a mixed economy.*

   Villages of people who have historically lived in cement-surfaced brick houses now reside along the periphery of Hammar marsh. These people were never displaced during the Saddam Hussein regime. They practiced a mixed economy, working in agriculture with palm trees intercropped with other crops, growing wheat, and tending sheep and goats. They also exploited the marshes with boats: fishing, birding, and collecting reeds. Those activities ceased with the drainage of the marsh in 1991, but the population quickly returned to marsh activities in mid-April with the reflooding.

4. *People living stably on the margin of the newly reflooded marshes who previously did not use the marsh as part of their economy.*

   Villages which were equally stable historically, its residents not having been displaced during the years of drainage, also reside along the western periphery of Hammar marsh. Here, the people grew palms, intercropped with winter wheat and summer rice. This season is the first time in 12 years that they have been able to grow rice, a good income earner, because of the reflooding of Hammar. These people have never exploited the marshes, except by drawing its water for field crops. They do not fish, hunt, have boats, collect reeds, or make mats.

5. *Former marsh dwellers who were internally displaced and live in the towns and cities not working in agriculture or marsh-related occupations.*

   A number of sub-tribes and individual marsh dwellers voluntarily left the marshes for cities and towns in the south. Others are said to be in Najaf and Baghdad or might have moved to the north as part of an Arabization of the Kurdish north. We do not know how many are in this category. People we met in Basra had moved from Hammar marsh in 1991. Many were working in occupations removed from the marshes, with the apparent exception of a sheikh who was a prominent importer of nylon nets from Thailand, which are widely used in the marshes by fisherman. They would consider returning to the marshes, where they spoke of large landholdings with orchards of date palms, but they demanded compensation for past mistreatment, new seed varieties, and a reliable water supply.

Public Health Conditions and Concerns

People in the marshlands suffer from an absence of primary health care, malnutrition, and contaminated drinking water. There are no government services. Schistosomiasis, worms, and cholera are prevalent. Clean drinking water is a problem throughout the area. Some people purchase tanker water, having some access to treated water, but those within the marshes drink directly from the untreated source. Drinking water quality was consistently mentioned by people as their first priority. Mosquitoes, which plagued people throughout the marshes, are the second priority heard from the marsh dwellers. The mosquito problem may have been worsened by the reflooding of the marshes which do not have adequate fish in number to eat the larvae.

Economic Assistance: Local Economy and Opportunities

The marshlands witnessed massive government investment over the past two decades to first drain the area and second develop an irrigation infrastructure for the cultivation of wheat. But there has been no investment to improve the lives of the local population for decades. All government policies and actions were directed toward making the people more subservient to and dependent upon the ruling clique. As a result, there is little economic opportunity within the marshes and on their periphery. The large numbers of displaced people were almost wholly dependent on monthly food allocations. Even those people who were not displaced and depended on wheat growing sold their harvests at a crippling loss to the government. The traditional economic pursuits, including commercial fishing and birding, were brought to a standstill. Mat-making continued in the larger towns of Al Chibayish and Hammar City, but was severely undermined by the drying of the marshes.

Today, economic activity in the marshlands revolves around subsistence and limited market wheat-growing. Agricultural activity in the region is largely a monoculture, although there are a few pockets date palm orchards and vegetables grown on the river banks.

Marshlands Status: Vegetation, Soil and Water

Water and soil samples were taken along with field measurements at 36 sites for salinity, conductivity, pH, water temperature, total dissolved solids, and redox and oxygen to assess the ecological and biogeochemical status of marshes that had remained flooded, were recently flooded, or were totally drained and dried out since the early 1990s. Samples were also taken at selected locations along the Tigris and Euphrates rivers, the Shatt al Arab, and selected canals, in order to determine current water quality conditions as well as assess the nutrient and chemical status of waters that are flowing to either the Persian Gulf or in some cases into the marshes. In addition, drinking water samples were taken at selected locations including in the marsh Arab villages to determine the quality of water that people were drinking. The detailed results of the soil and water samples are available and will be published soon.

Water Resources: Drainage Structures and Flow Data

During the past twenty years, much of what was known about the drainage structures came from analyses of remote sensing photographs. The previously inaccessible area has been the battleground for three major wars and for a massive drainage effort which the Saddam Hussein regime characterized as the physical infrastructure for an irrigation network. The USAID scoping team made the first on-the-ground assessment of this massive drainage system to date.

Preliminary Conclusions

Based on the historical background and recent research conducted regarding the marshlands and the local residents, USAID has reached the following preliminary conclusions. These conclusions inform the Agency's program objectives and approach.

- After twenty years of almost continuous wars, sanctions, and persecution of the local people, the area is bereft of a stable economy and desirable employment opportunities. Marsh-based activities will probably not provide an adequate economic base to this savaged area.
- Despite their ethnic homogeneity, there are a number of distinct patterns of economic utilization of the marsh dwellers, both voluntary and involuntary. The most surprising pattern is by those living on the periphery: some practiced a mixed economy of agriculture and marsh use, while others only practiced agriculture, despite their physical proximity. With the reflooding of areas of the marshes, people often moved quickly to re-exploit the areas, taking up boating, fishing, and reed harvesting where sufficient reeds were available.
- Although there has been considerable physical and social upheaval during the past twenty years in the marshes, there is also a remarkable degree of social continuity, given that tribes or sub-tribes usually moved as a group from location to location by the government. The key role of tribal elders has remained largely intact.
- People in the marshes are requesting clean drinking water, mosquito control, employment opportunities, health care, and improved security. Many internally displaced people and external

refugees are expected to return to the marshes in the coming months and years. They ask for social services that have never been accessible to them in the past but ought to be expected of any representative civil society in the future.

- More on-the-ground investigation and discussions with the Ministry of Water Resources district offices are needed to understand the drainage system and develop a precise inventory of all structures.
- Some portions of Hawizeh and Hammar marsh still retain native vegetation and good water quality. These regions may be a seed source and faunal population base for restoring the drained marshes. By contrast, Central marsh has suffered massive drainage, and little wetland remains.
- Vast areas of former marsh are now barren or are sparsely covered with Tamarix and other desert species. Dust storms are now prevalent in the former marsh areas. Larger than expected quantities of water were present in southern Iraq, and some of the formerly drained wetlands have recently been reflooded

II. USAID Program Objectives

In response to the human and ecological conditions described above, USAID, in concert with international and local Iraqi stakeholders, has developed the following objectives for its 12-month program.

- To construct an accurate environmental, social, and economic baseline of the remaining and former marshlands to plan interventions and measure their success;
- To assist with the repatriation and resettlement of marshland dwellers in the region, who will require viable economic opportunities and social institutions that are fair and equitable and give them a voice;
- To improve the management of existing marshlands and explore options to restore adjacent drained marshes; and
- To develop and reach a broad consensus on a long-term comprehensive wetland restoration strategy integrated with a regional social and economic development program.

Elements of the Program Approach

The major elements of the program's approach are to:

Integrate economic development and ecosystem marsh management;

Implement restoration and social economic assistance programs through priority pilot projects;

Collect and monitor data for reflooded sites; and

Develop local capacity in government and universities in marshland management and restoration.

U.S. Agency and International Donor Participation

In the highly dynamic, post-war situation, the U.S. Agency for International Development is leading an interagency effort with the U.S. State Department's Bureau for Oceans and International Environmental and Scientific Affairs (OES) to develop an action plan for marshland restoration. USAID and State/OES work closely with other government entities through the Interagency Marshlands Subgroup, the first of many anticipated special task forces addressing major environmental issues in Iraq. The subgroup includes representatives from the State Department, Army Corps of Engineers, U.S. Geological Survey, Environmental Protection Agency, Fish and Wildlife Service, and other agencies.

The subgroup meets regularly to explore technical issues, review donor participation, and monitor progress. It is an aim of the U.S. government to internationalize the program, recognizing that the program's ultimate success depends on both Iraqi and international participation and consensus. Thus far, the following bilateral donors have expressed an interest in supporting or directly participating in the program:

- **Great Britain** - supplied a technical expert on the second field trip to the marshlands;
- **Australia** - provide technical experts on marshlands and agricultural soil salinity problems and develop desalination strategies through the Commonwealth Scientific and Industrial Research Organization (CSIRO), a recognized leader in the field;
- **Canada** - will provide technical expertise in biological monitoring and wildlife conservation to the second field visit and work in partnership in program design as the lead into a larger funded program; and
- **Italy** - fund modeling, water budgeting, and environmental assessments through the Iraq Foundation for a long-term program design.
- **Japan** - has expressed interest in providing equipment and funding rural infrastructure in the marshes

On the multilateral side, we have engaged the Secretariat of the Ramsar Convention on Wetlands, which draws upon a roster of internationally recognized experts in wetlands and marshlands for technical support. United Nations and other international agencies that have shown an interest in becoming involved in as yet to be determined roles include: the World Health Organization, the United Nations Environmental Programme (UNEP), and the International Organization for Migration (IOM). The World Conservation Union (IUCN) has also expressed an interest in participating, particularly in working on water flow issues with other countries in the region.

Accomplishments of USAID Program

Implementation of USAID's marshland restoration and management program was initiated with the fielding of a small technical team to conduct a rapid assessment of the current situation in the marshlands from June 15-28, 2003. This visit to the marshlands in southern Iraq was the first on-the-ground scientific assessment in two decades. Their goals were to begin data collection to develop an action plan for the program.

Despite the security and communications concerns, the team's work exceeded expectations. There was virtually no scientific database covering the past 30 years in the marshes. The few studies during the previous regime were politically motivated to give credence to the repressive actions. No social or economic information appear to exist for half a century. During the scoping trip, the team:

- *Extensively visited the existing, reflooded, and drained marshes on the ground and in helicopter flyovers.* This scoping team was the first scientific/development effort in the Iraq marshlands for at least two decades and the first to begin the systematic canvassing of the region. Previously, all information about the draining of the marshes and its impact was gleaned through remote sensing photography, never on the ground and analyzed from a distance. The team found several areas of healthy regrowth of reeds and other freshwater vegetation and wildlife, and others with serious salinity and only salt plants. Early concerns about endangered seed banks because of highly saline water and soils may be less serious than anticipated, but further investigation is required.
- *Collected soil and water samples from the natural and reflooded marshes.* The team collected approximately 60 marsh and drinking water and 20 soil samples in the three marshes in existing and reflooded sites and in the drained marshes. The samples are being analyzed for a full range of parameters, including salinity, toxicity, pesticides, heavy metals, and water vector diseases. The team also did immediate data analyses on salinity, conductivity, total dissolved solids, dissolved oxygen, and pH. An interesting finding was that salinity was far lower than had been anticipated. The salinity of most of the water was 1.0 part per thousand (PPT) or less, rather than the 3.0-5.0 ppt expected. This level will support new freshwater plant growth. However, one site was 17.5 ppt, half of seawater, in a reflooded area of high soil salinity, with virtually no vegetative growth and no flowing water.
- *Met with marsh dwellers to assess social and economic conditions.* The team visited a wide range of tribesmen and women throughout the marshes from the traditional floating islands populations to rice growers living on the periphery. Many told horrific stories of repeated displacement, persecution, and destruction, eking out a minimal existence on wheat-growing and government handouts of basic foodstuffs. Others lived stably on the edges of the marshes, even during the entire time they were drained. Some never exploited the marshes directly, despite their proximity. Others had a mixed economy, and returned to the marshes, using boats for fishing and reed collecting when the waters returned two months ago. Initial conversations reveal diverse economic niches of the marsh dwellers. In general, they suffer from an absence of public heath services and lack clean drinking water. Many are drinking untreated water directly out of the marshes. Both illness and malnutrition are endemic.
- *Involved scientists from the University of Basra. The previous regime systematically destroyed an*

independent, intellectual community in the country. The research centers and universities acted as Baathist havens. The College of Agriculture and the Marine Science Center are now shells of the well-known, highly regarded institutions they were once. Staff have been isolated from new developments in their fields for the past 20 years and lack any knowledge of environmental science and wetlands ecology, but they are well trained in their narrow technical fields. They are eager to participate in the program, which can offer training and research opportunities. The center was badly looted, although some faculty were able to hide equipment in their homes before the war ended. The center and other research entities will serve as partners on the program so that skills are transferred and wetlands management approaches can be institutionalized in Iraq.

- *Established working relationships with national and district level Ministry of Water Resources officers and obtained some flow data.* The team worked closely with the Ministry of Water Resources (MWR) officers at the national and district levels. Both accompanied the team during its visits, collecting data, conducting interviews, and discussing program options actively. We see this as the first step toward their full participation. The team was able to collect some flow data during the visit from one district office. Visits to the district MWR offices in Al Amarah and Al Nasiriyah indicate the need for different strategies for partnering. The Al Amarah office had been entirely stripped, while the Al Nasiriyah office was completely intact, due to the quick thinking and effective actions of its director. As such, they are likely to play different program roles, at least in the short run.

III. Next Steps

USAID's $4-million Marshlands Restoration and Management Program will provide social and economic assistance to the marsh dwellers integrated with wetlands restoration, and build the capacity of the Iraqi counterpart agencies including Ministry of Water Resources, the Ministry of Agriculture and the Ministry of the Environment. On-going interventions include:

- Implementing a river basin and hydraulic model of the marshes to improve water allocation and management through the Ministry of Water Resources and the US Army Corps of Engineers
- Equipping a soil and water quality lab at the newly established Center for Iraq Marshlands Restoration
- Implementing pilot projects in reconstructed wetlands focusing on improved waste drinking water and sewage treatment.
- Providing social economic assistance through job creation and income generating activities in agriculture/agribusiness; fisheries/aquaculture, livestock/dairy production, and date palm reproduction
- Monitoring of water quality in reflooded sites.
- Extending health care services to the marsh dwellers in collaboration with AMAR Charitable Trust Foundation
- Arranging study tours for Iraq specialists and decision-makers to visit wetlands in the US and Europe in early 2004. Short courses on wetlands reconstruction and management will be offered for ministry officials and local decision-makers.
- Building local capacity by partnering with Iraqi institutions such as the Ministry of Water Resources, the Ministry of the Environment and the University of Basrah, College of Agriculture as well as international NGO's.